

# FIELD PLANTING CONTAINERIZED LONGLEAF PINE SEEDLINGS

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**ABSTRACT**—The difficulty in establishing stands of longleaf pine (*Pinus palustris* Mill.) by artificial regeneration techniques has been a major factor in the decline of the number of acres occupied by this species in the Southeast. Many landowners and managers have been reluctant to plant longleaf because of its history of poor survival. Loblolly pine (*Pinus taeda* L.) and slash pine (*Pinus elliotii* Engelm.) now occupy many sites that longleaf pine dominated in the past. A renewed interest in longleaf regeneration has been developed in the past several years, and a substantial number of acres are now being reforested with longleaf pine. Research, development of containerized longleaf pine seedlings, and improved management practices have done a lot to eliminate most of the difficulties encountered in artificially regenerating longleaf pine stands.

## INTRODUCTION

Longleaf pine (*Pinus palustris* Mill.) ecosystems dominated a reported 90 million acres of the Southeast at the time of early settlement. Less than 3 million acres of longleaf still exist in the Southeast, most of it in the Coastal Plains of the Carolinas, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas (Gjerstad and Johnson 1997). The reason for the decline was mainly because of difficulties in regeneration of the species. Longleaf pine can stay in the “grass stage” for the first seven or more years of its establishment. In this stage, it has no stem and is extremely vulnerable to competition. If it does survive, a significant percentage of growth will have been lost, and the stand rotation is extended. Few, if any, forest landowners or managers want to have a tract of land sit idle for 7 years or more! The developments of containerized longleaf seedlings, and improved silvicultural practices, have done much to overcome the challenge of longleaf regeneration. By choosing the right site, utilizing high quality containerized seedlings, demanding quality-orientated planting practices, and taking advantage of improved silvicultural techniques, longleaf pine can be successfully established within its natural range.

## SITE

### Habitat

Longleaf is found in well-drained sandy soils of flatlands and sand hills, often in pure stands (Little 1980). Longleaf will perform well on poorer sandy soils where loblolly and slash do not grow satisfactorily. Longleaf is highly drought resistant because of its deep taproot. Longleaf is also very fire resistant, and this can be used as an advantage in competition control, stand management, and regeneration. Fire is used to control brown spot disease (*Scirrhia acicola*) in young, natural, or planted longleaf stands (USDA 1989).

### Range

The range of longleaf is the Coastal Plain from southeast Virginia south to east Florida, and then west to east Texas. It is usually found below 600 feet in the Coastal Plain and up to 2,000 feet in the foothills of the Piedmont (Little 1980).

## SITE PREPARATION

Site preparation can range from a clean clear-cut to a mechanically prepared site. The economics and silviculture requirements rule this decision. Some of the factors to keep in mind are the presence or potential of competition, terrain, and the probability of erosion on the site. From experience, we have found that initial survival is not dependent on site preparation in most cases. The qualities attained on the planting job and competition control are the main factors encouraging early emergence from the grass stage and stand establishment. Early season weed control and/or a release treatment are essential. The longleaf seedlings must be free of competition during the first growing season in order for them to come out of the grass stage and initiate early height growth.

## CONTAINER-GROWN SEEDLINGS

Container-grown longleaf seedlings come in a variety of sizes. The main points to consider are vigor, needle length, plug quality, and root condition. The seedlings should have a good green color with needles 6 inches or more in length. The plug should be firm, moist, and durable to hold up under planting conditions. The taproot at the bottom of the plug should be air pruned and callused. Lateral root tips visible on the outside of the plug should be firm and healthy. Visible mycorrhiza is desirable. Root collar diameter should be 3/16 to 1/4 inch. Although it is hard to see, a dormant bud should be present. The seedlings may be shipped in the containers that they were grown in, or the plugs may be pulled and packed in boxes for transport. In the field, an all-wheel-drive four-wheeler is a very useful piece of equipment to transport bulk seedlings to the planting crew personnel.

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## PLANTING

### Timing

In general, fully developed container seedlings of all species can be planted at anytime during the year. They are very useful in reforestation of problem sites. Some examples would be sites that are flooded during or immediately following the normal planting season, sites that possibly have seasonal drought problems, and interplanting during the growing season on sites that have unacceptable stocking. Container longleaf seedlings are very suitable for fall planting. As long as there is sufficient ground moisture, container longleaf seedlings can be planted from mid-September to late November with very good results. It is my opinion that fall is the best time to plant container longleaf seedlings in the Southeast. The seedlings planted during this period have some time to initiate root growth before winter dormant conditions. Initial root growth of an inch or more is not uncommon on fall-planted seedlings. In the spring, these trees will have a head start over trees planted during the winter months (December to March).

### Stocking

Longleaf pine is adapted to growing at a heavier density than loblolly or slash. A good site can easily support 600 or more stems per acre. A suitable range to work with would be a stocking of 544 trees per acre (8 by 10 feet) to 622 trees per acre (7 by 10 feet). The site and the long-range management plan for the stand will have a direct influence on the initial stocking and spacing choices. The width between rows and the distance between trees in the row can be determined by the landowner's preferences.

### Methods

Longleaf pine can be successfully planted using most of the conventional tools. Hand crews using container dibbles, standard dibble bars, hoedads, and planting shovels have been used to establish longleaf plantations. Container seedlings can also be machine-planted with high survival rates. As long as the tool will make a satisfactory opening to plant the seedling, good survival can be expected. The key to good survival with container longleaf, planted by hand or machine, is the depth that the plug is planted. The top of the plug must be covered to prevent moisture from wicking out

of the growing media, but the seedling's bud should not be covered. Care must be taken to assure that the plug will not be uncovered by erosion or the bud covered by soil washing in on top of the seedling. Mechanically prepared sites must be fully settled before planting. Packing the soil around the plug is also important. Air pockets will damage or kill a container seedling just as quickly as a bareroot one. Good crew supervision is important on container planting jobs. A working supervisor or leader should be present with the crew at all times. The landowner or his representative should, at the minimum, audit planting jobs on a daily schedule.

## SUMMARY

Longleaf pine can be successfully regenerated by artificial methods. Using container seedlings and sound silvicultural practices will help to make the task possible. Common sense and attention to detail will help you achieve the goals that you set. Tree nurseries and seed orchards provide a wide variety of pine and hardwood seedlings for landowners. Although the quality of the seedlings has been greatly improved through research in recent years, survivability depends largely on care taken in storing, transporting, and planting. (Georgia Forestry Commission 1989) The landowner has the responsibility to ensure that everything is done in the proper manner and on schedule. A good goal to keep in mind is that the trees that you are planting today will be the stand you will have to manage tomorrow. A high-quality planting job will go a long way to ensure that there will be a good, fully stocked stand to manage. This will ultimately provide the maximum volume of high value products for your investment of time and capital.

## REFERENCES

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